<u>REMARKS</u>

The present application was filed on February 20, 2004 with claims 1-19. Claims 4-7, 10-12, 15, 16, 18, and 19 have been withdrawn. Claims 1-19 are presently pending in the above-identified patent application. Claims 1, 2, 8, 13 are proposed to be amended herein. Support for the amendments can be found, for example, on page 10, paragraph [0124], page 10, paragraphs [0128-0129], page 9, paragraph [0119], page 2, paragraph [0016] and [0023], and page 9, paragraphs [0122] through page 10, paragraph [0123]. No new matter is being introduced.

In the Office Action, the Examiner: (i) rejected claims 1-3, 8-9 and 13-14 under 35 U.S.C. §101 because the claimed invention is allegedly directed to non-statutory subject matter, (ii) rejected claims 1-3 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, and (iii) rejected claims 1-3, 8, 9, 13, 14, and 17 under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,706,498 to Fujimiya et al. (hereinafter "Fujimiya") in view of U.S. Patent No. 6,714,874 to Myers et al. (hereinafter "Myers").

The comments of the Examiner in forming the rejections are acknowledged and have been carefully considered.

§101 Rejection

As noted above, the Examiner rejected claims 1-3, 8-9 and 13-14 under 35 U.S.C. §101 because the claimed invention is allegedly directed to non-statutory subject matter. Specifically, page 2 of the Office Action states that

> [c]laims 1-3 recites a "system" containing various units. Giving the claims a broad reasonable interpretation, these limitations are broad enough to encompass a software system with software components. Claims 1-3 is therefore held as software per se.

Applicant notes that as stated by the United States Court of Appeals for the Federal Circuit (*In re Bilski* (2008)), "A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing." As such, Applicant respectfully asserts that, as amended, independent claim 1, and claims 2 and 3 dependent therefrom, recite a tie to a particular machine or apparatus, namely, a hardware processor. Support for the amendments can be found, for example, on page 10, paragraph [0124], page 10, paragraphs [0128-0129], page 9, paragraph [0119], page 2, paragraph [0016] and [0023], and page 9, paragraphs [0122] through page 10, paragraph [0123].

Additionally, Applicant respectfully submits that the ties to the units that execute on a hardware processor, as well as the tie to an apparatus such as a computer, overcome the rejection and provide patentable subject matter. In *Ex parte Bo Li*, Appeal 2008-1213 (BPAI 2008), the BPAI stated that

> the instant claim presents a number of software components, such as the claimed logic processing module, configuration file processing module, data organization module, and data display organization module, that are embodied upon a computer readable medium. This combination has been found statutory under the teachings of *In re Lowry*, 32 F.3d 1579 (Fed. Cir., 1994).

Applicant asserts that, as amended, claims 1-3 provide patentable subject matter by claiming distinct units embodied on a tangible computer-readable recordable storage medium that execute on a hardware processor.

Also, page 3 of the Office Action states that

> [c]laims 8-9 and 13-14 are drawn to a process. A process is statutory subject matter under 35 U.S.C. 101 if: (1) it is tied to a particular machine or

apparatus or (2) it transforms an article to a different state or thing (In re Bilski,
88 USPQ2d 1385 Fed. Cir. 2008)

The claimed subject matter is not limited to a particular apparatus or machine.

Applicant respectfully submits that, as amended, claims 8-9 and 13-14 provide patentable subject matter. Similar to the amendments and corresponding arguments above in connection to claims 1-3, Applicant respectfully submits that the ties to the units in claim 8 and 13 that execute on a hardware processor, as well as the tie to an apparatus such as a computer, overcome the rejection and provide patentable subject matter. (See, *Ex parte Bo Li*.)

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the §101 rejection of claims 1-3, 8-9 and 13-14.

§112 Rejection

Additionally, as noted above, the Examiner rejected claims 1-3 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, beginning on page 3, the Office Action states that

> claims 1-3 recite "unit for" limitations. It is noted that some of the limitations in claims 1-3 invoke 35 U.S.C. 112, 6th paragraph, whereas others do not. Therefore, it is unclear if Applicant is intending to invoke 35 U.S.C. 112, 6th paragraph, for claims 1-3.

Applicant respectfully submits that, as amended, claims 1-3 denote that the units are distinct physical units, each being embodied on a tangible computer-readable recordable storage medium and executing on a hardware processor. Applicant asserts that this clarifies the above-noted issue. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the §112 rejection of claims 1-3.

§103 Rejection

Further, as noted above, the Examiner rejected claims 1-3, 8, 9, 13, 14, and 17 under 35 U.S.C. §103(a) as allegedly being unpatentable over Fujimiya in view of Myers. With regard to

the §103 rejections, Applicants initially note that a proper *prima facie* case of obviousness requires that the cited references, when combined, must "teach or suggest all the claim limitations," and that there be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references or to modify the reference teachings. See MPEP §706.02(j). As described herein, Applicant respectfully submits that the combination of references does not teach all of the claim limitations.

Page 7 of the Office Action states that

> Fujimiya et al. do not describe evaluation performed in descending order from a first (maximum) edit distance value to a second edit distance value, the second edit distance value being lower than the first (maximum) edit distance value.

Further, beginning on page 7, the Office Action claims that

> Myers et al. describe determining the genomic and screening fragments with their complementary sequences..., identifying a high edit score, inserting a column at the left border of the region, sweeping region from left to right and moving bases leftward if such a move decreases the edit score, repeating the sweeping from right to left, comparing alignments produced in both sweeps and keeping the alignment with the lowest edit score... which represents an evaluation is performed in descending order from a first (maximum) edit distance value to a second edit distance value, the second edit distance value being lower than the first (maximum) edit distance value.

Applicant respectfully submits that Myers does not teach the claimed aspect of performing a binding possibility evaluation in descending order from a first edit distance value to a second edit distance value, the second edit distance value being lower than the first edit distance value. First, Applicant notes that Myers does not teach evaluating anything for the purposes of determining binding possibility of a target sequence to a probe sequence, as is taught in independent claims 1, 8, 13 and 17. Myers discloses "methods and systems for assembling a genome from a shot-gun set of end sequenced DNA fragments." (See, Abstract)

Additionally, even if Myers did teach such an evaluation, Myers does not teach performing one in descending order, such as is claimed in independent claims 1, 8, 13 and 17. Myers teaches moving left and right within a selected region of bases and "moving bases" within

the region of bases until a lowest edit score alignment is determined for the selected region of bases. (See, column 24, lines 13-30) Independent claims 1, 8, 13 and 17, on the other hand, explicitly disclose <u>evaluating a binding possibility</u> of the target nucleotide sequence data to the probe nucleotide sequence, wherein the evaluation is performed <u>in descending order from the maximum acceptable edit distance to a second edit distance</u>, a value of the second edit distance being lower than a value of the maximum acceptable edit distance. In other words, the evaluation for binding possibility of the target and probe sequence (which Myers does not teach) is performed multiple times, in descending order of edit distance value. Myers does not perform any such analysis, and further, does not perform any analysis on different edit distance values. Rather, Myers simply moves bases within a selected region in order to determine a lowest edit score.

As such, Applicant asserts that neither Myers nor Fujimiya teach the noted claim aspect. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Further, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Further, as emphasized in a previous response, the claims recite that the evaluation result of the evaluation process is used by a user in <u>determining binding effectiveness and reliability of the probe nucleotide sequence to the target nucleotide sequence</u>. Applicant believes that this language, at the very least, distinguishes the recited claims from the combination of references. Fujimiya simply retrieves genes from a gene database using a sequence as a key, while Myers discloses assembling a genome from a shot-gun set of end sequenced DNA fragments.

Additionally, Applicant respectfully submits that neither Fujimiya nor Myers teach the use of distinct units embodied on a tangible computer-readable recordable storage medium that execute on a hardware processor, as explicitly taught in claims 1, 2, 8, 13, and claims dependent therefrom. Specifically, Applicant asserts that the cited references, individually or in combination, do not teach a target nucleotide sequence storing unit executing on a hardware processor, a complementary sequence data storing unit executing on a hardware processor, a maximum edit distance storing unit executing on a hardware processor, a storage unit executing

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on a hardware processor or a evaluation processing unit executing on a hardware processor. As such, Applicant respectfully submits that Fujimiya in view of Myers does not teach or suggest all the claim limitations.

Accordingly, withdrawal of the §103(a) rejection of claims 1-3, 8, 9, 13, 14, and 17 is respectfully requested.

Consequently, all of the pending claims, i.e., claims 1-19, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

Respectfully submitted,

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